

IN THE CLAIMS:

~~Please amend Claim 1 as follows:~~

1. (Amended) An additive composition for a liquid combustible fuel wherein the liquid combustible fuel is selected from the group consisting of gasoline, kerosene, diesel fuel, heating fuel and other liquid petroleum distillates, which additive comprises:

(a) one or more alcohols selected from the group consisting of water soluble alcohols :

(i) ethanol in an anhydrous state, ethanol having between about 0.5 to 36% water by volume, ethanol having methanol up to 5% by volume of ethanol added, or ethanol having between about 0.5 and 36% water by volume and also having methanol up to 5% by volume of ethanol added,

(ii) optionally n-propanol, iso-propanol, n-butanol, iso-butanol, n-pentanol or iso-pentanol, and

(iii) combinations of (a) (i) and a (ii);

one or more of the following components selected from (b), (c) or combinations of (b) and (c):

b. one or more alcohols selected from the group consisting of:

(i) straight-chain or branched-chain, saturated or unsaturated alcohols having between about 6 and 12 carbon atoms;

(ii) optionally straight-chain or branched chain, saturated or unsaturated alcohols having between about 13 and 18 carbon atoms. and

(iii) optionally one or more ethoxylated alcohols selected from the group of alcohols having between 6 and 18 carbon atoms wherein the ethylene oxide add-on is less than 5 moles; and

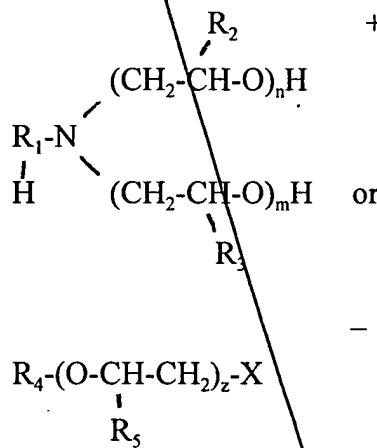
(iv) combinations of (b) (i), (b) (ii) and (b) (iii); and

(c) a fatty acid of the structure R-(C=O)-OH, wherein R is selected from alkyl, alkenyl or alkynyl having between about 10 to 24 carbon atoms, in combination with a source of nitrogen in an anhydrous state or as an aqueous solution selected from the group consisting of the

ammonia, hydrazine, alkyl hydrazine, dialkyl hydrazine, urea, ethanolamine, monoalkyl ethanolamine, and dialkyl ethanolamine wherein alkyl is independently selected from methyl, ethyl, n-propyl or isopropyl; wherein trialkylamines are excluded;

wherein component a and one or more of components b, c, or combinations of b and c thereof as the additive when combined with mixing with liquid combustible fuel form a clear, stable microemulsion fuel composition having a viscosity similar to that of the liquid combustible fuel, and where the ratio of liquid combustible fuel within $\pm 10\%$ of the original viscosity of the fuel, additive ranges from about 50:50 to 99:1 by volume producing a microemulsion liquid fuel composition,

wherein said liquid fuel composition as a microemulsion excludes the presence of ethylene glycol, glycerine, polyethylene, polypropylene, added aromatic organic compounds, sulfur, sulfur compounds, metals, metal compounds, compounds of phenanthrene, and emulsifiers of the general formula:



wherein R₁ and R₄ each independently is a saturated or unsaturated, straight-chain or branched hydrocarbon aliphatic radical each of 4 to 24 carbon atoms selected from alkyl or alkenyl or R₄ is alkylphenyl of 1 to 18 carbon atoms in the optionally branched alkyl chain or H; R₂, R₃ and R₅ each independently represent a methyl group or H, n plus m is an integer from 1 to 20; z is an integer from 0 to 15; and X is

-COO(-) or -OCH₂COO(-) wherein, substituents R₂, R₃ and R₅ are the same or different in different monomer units of each chain, and other organic diacids;

with the proviso that when the combustible fuel is gasoline component (c) is excluded and

with the proviso that when the additives for diesel fuel are anhydrous, component (c) is optional.

wherein the microemulsion formed meets existing U.S. Environmental Protection Agency (EPA) fuel property specifications for use in existing engines requiring little or no retrofit of the existing engines and when combusted emits reduced exhaust emissions to meet existing U.S. Environmental Protection Agency (EPA) exhaust emission specifications.

wherein said additives contain only atoms of carbon, hydrogen, oxygen and nitrogen. [fuel, which is also used as a fuel composition, to utilize readily available and renewable resources, to improve liquid combustible fuel properties, reduce undesirable elements such as sulphur, aromatic hydrocarbons, and glycerine from the content of the fuel, produce improved combustion, and to reduce visible smoke, particulates and other noxious emissions production of the combusted fuel, which additive or fuel composition comprises:

- a. one or more alcohols selected from the group consisting of water-soluble alcohols:
 - (i) having between about 1 and 2 carbon atoms, selected from the group consisting of methanol and ethanol in an anhydrous state or as a 0.5-36% aqueous solution by volume; or
 - (ii) having between about 3 and 5 carbon atoms, selected from the group consisting of propanol, iso-propanol, butanol, and pentanol by volume or combinations of (a)(i) and a(ii); and optionally one or more of the following:
- b. one or more alcohols selected from the group consisting of:
 - (i) straight or branched chain, saturated or unsaturated alcohols, which are clear and liquid at room temperature, and having between about 6 and 12 carbon atoms, or
 - (ii) straight- or branched-chain, saturated or unsaturated long-chain fatty alcohols, which are solid at room temperature, having from between about 13 and 18 carbon atoms, or combinations of (b)(i) and (b)(ii);

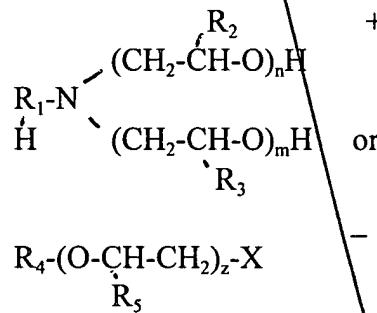
c. one or more ethoxylated alcohols selected from the group consisting of alcohols having between 6 and 18 carbon atoms, where the ethylene oxide add-on is less than 5 moles (units);

d. a fatty acid of the structure R-(C=O)-OH, wherein R is selected from alkyl, alkenyl or alkynyl having between about 10 to 24 carbon atoms, with

e. a source of nitrogen in an anhydrous state or as an aqueous solution selected from the group consisting of the ammonia, hydrazine, alkyl hydrazine, dialkyl hydrazine, urea, ethanolamine, monoalkyl ethanolamine, and dialkyl ethanolamine wherein alkyl is independently selected from methyl, ethyl, n-propyl or isopropyl, wherein trialkylamines are excluded;

wherein components a and one or more of b, c , d, and e, when combined with mixing with combustible fuel form a clear, stable microemulsion having a viscosity similar to that of the liquid combustible fuel, and where the ratio of combustible fuel: additive ranges from about 99:1 to 0:100 by volume;

wherein said additive/fuel composition excludes ethylene glycol, glycerine, polyethylene, polypropylene, aromatic organic compounds, sulfur, sulfur compounds, metals, metal compounds, compounds of phenanthrene, and emulsifiers of the general formula:



wherein R₁ and R₄ each independently is a saturated or unsaturated, straight-chain or branched hydrocarbon aliphatic radical each of 4 to 24 carbon atoms (e.g., alkyl or alkenyl) or R₄ is alkylphenyl of 1 to 18 carbon atoms in the optionally branched alkyl chain or H; R₂, R₃ and R₅ each independently represent a methyl group or H, n plus m is an integer from 1 to 20; z is an

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integer from 0 to 15; and X is -COO(-) or -OCH₂COO(-), wherein, substituents R₂, R₃ and R₅ are the same or different in different monomer units of each chain, and optionally other organic diacids are excluded.]

Please cancel claims 2-28 without prejudice or disclaimer, and examine new presented Claims 30-58 in their place.

- 30. The additive of claim 1 wherein the combustible fuel is gasoline wherein:
- in subpart (a) the ratio of (a)(i):(a)(ii) is 100:0 to 50:50 where (a) (i) is anhydrous and water is excluded and straight-chain alcohols of (a)(ii) are excluded,
 - in subpart (b) the ratio of (b)(i):(b)(ii) is 100:0 to 50:50 where straight-chain alcohols of (b)(ii) are excluded and (b)(iii) is excluded, and
 - in subpart (c) is excluded.

31. The additive of claim 1 wherein the combustible fuel is gasoline wherein in the additive:

the ratio of subpart (a) and subpart (b) is between about 99:1 to 25:75.

32. The additive of claim 1 wherein the combustible fuel is gasoline wherein: the ratio of liquid combustible fuel to additive is between about 99:1 to 80:20,

33. The additive of claim 1 wherein the combustible fuel is gasoline,
in subpart (a) (i) the alcohol is only ethanol,
in subpart (a) (ii) the alcohol is iso-propanol and
in subpart (b) (i) the alcohol is a branched chain saturated alcohol having 6 to 12 carbon atoms.

34. The additive of claim 1 wherein the combustible fuel is gasoline,
in subpart (a)(i) the alcohol is only ethanol and water is excluded,
in subpart (a)(ii) the alcohol is only iso-propanol, and
in subpart (b)(i) the alcohol is 2-ethyl-hexanol-1.

35. The additive of claim 1 wherein:

- in subpart (a)(i) the alcohol is ethanol,
- in subpart (a)(ii) the alcohol is isopropanol; and
- in subpart (b)(ii) the alcohol is selected from branched chain saturated alcohols of C6-12.

36. The additive of claim 1 wherein the combustible fuel is selected from the group consisting of diesel fuel, kerosene, heating oil, or other petroleum distillates wherein;

in subpart (a) the ratio of (a)(i):(a)(ii) is between about 100:00 to 50:50 where (a)(i) is anhydrous and aqueous is excluded,

in subpart (b) the ratio of (b)(i):(b)(ii) + (b)(iii) is between and about 100:0 to 50:50,

in subpart (b) the ratio of (b)(ii):(b)(iii) is between and about 100:0 to 0:100, and

in subpart (c) is excluded.

37. The additive of claim 36 wherein:

the ratio of subparts (a):(b) is between about 60:40 to 40:60.

38. The additive of claim 36 wherein:

the ratio of combustible fuel: additive is between about 99:1 to 50:50.

39. The additive of claim 36 wherein:

in subpart (a)(i) the alcohol is ethanol and water is excluded,

in subpart (a)(ii) the alcohol is iso-propanol,

in subpart (b)(i) the alcohol is 2-ethyl-hexanol-1 or C8-10 alcohols,

in subpart (b)(ii) the alcohol is branched-chain C13-18 alcohols, and

in subpart (b)(iii) the alcohol is C12-16 with 3 ethylene oxide add-ons.

40. The additive of claim 36 wherein:

in subpart (a)(i) the alcohol is ethanol,

in subpart (a)(ii) is excluded,

in subpart (b)(i) the alcohol is a branched chain saturated C6 to 12 alcohol, and,

in subpart (b)(ii) and subpart b(iii) are excluded.

41. The additive of claim 36 wherein:

in subpart (a)(i) the alcohol is ethanol,

in subpart (a)(ii) the alcohol is isopropanol,

in subpart (b)(i) the alcohol is a branched chain saturated C6-C12 alcohol, and

in subpart (b)(ii) the alcohol is a C13 to 18 alcohol.

42. The additive of claim 1 wherein the combustible fuel is selected from the group consisting of diesel fuel, kerosene, heating oil or other petroleum distillate fuels wherein:

in subpart (a) the ratio of (a)(i):(a)(ii) is between about 100:0 to 50:50 where (a)(i) is anhydrous or 0.5 to 10% aqueous,

in subpart (b) the ratio of (b)(i):(b)(ii)/(b)(iii) is between about 100:0 to 50:50,

in subpart (b) the ratio of (b)(ii):(b)(iii) is between about 100:0 to 0:100, and

in subpart (c) nitrogen is present to neutralize between about 40 to 85% of the fatty acid.

43. The additive of claim 42 wherein:

the ratio of subparts (a):(b) + (c) is between about 75:25 to 40:60,

the ratio of subparts (b):(c) is between about 100:0 to 0:100.

44. The additive of claim 42 wherein:

the ratio of combustible fuel: additive is between about 99:1 to 50:50.

45. The additive of claim 42 wherein:

in subpart (a)(i) the alcohol is ethanol with 5% by volume or less of methanol,

in subpart (a)(ii) the alcohol is iso-propanol or iso-butanol,

in subpart (b)(i) the alcohol is 2-ethyl-hexanol-1 or C8-10 alcohols,

in subpart (b)(ii) the alcohol is branched-chain C13-18 alcohols,

in subpart (b)(iii) the alcohol is C12-18 with 3 ethylene oxide add-ons,

in subpart (c) is linoleic acid or oleic acid or combinations thereof, and

in subpart (c) is aqueous ammonia, urea or combinations thereof.

46. The additive of claim 42 wherein:

in subpart (a)(i) the alcohol is ethanol with 5% by volume or less of methanol,

subpart (a)(ii) is excluded,

in subpart (b)(i) the alcohol is 2-ethyl-hexanol-1 or C8-10 alcohols,

subpart (b)(ii) and,

subpart (b)(iii) are excluded,

in subpart (c) is linoleic acid or oleic acid or combinations thereof, and

in subpart (c) is aqueous ammonia or urea or combinations thereof.

47. The additive of claim 42 wherein:

in subpart (a)(i) the alcohol is ethanol with 5% by volume or less of methanol,

in subpart (a)(ii) the alcohol is iso-propanol,

subpart (b)(i),
subpart (b)(ii) and
subpart (b)(iii) are excluded,
in subpart (c) is linoleic acid, oleic acid or combinations thereof, and
in subpart (c) is aqueous ammonia, urea or combinations thereof.

48. The additive of claim 1 wherein the combustible fuel is selected from the group consisting of diesel fuel, kerosene, heating oil and other distillate fuels wherein:

in subpart (a) the ratio of (a)(i):(a)(ii) is between about 100:0 to 50:50 where (a)(i) is anhydrous or 11 to 36% aqueous,
in subpart (b) the ratio of (b)(i):(b)(ii)/(b)(iii) is between about 100:0 to 50:50,
in subpart (b) the ratio of (b)(ii):(b)(iii) is between about 100:0 to 0:100, and
in subpart (c) nitrogen is present to neutralize between about 40 to 85% of the fatty acid.

49. The additive of claim 48 wherein:

the ratio of subparts (a):(b)+(c) is between about 60:40 to 40:60, and
the ratio of subparts (b):(c) is between about 75:25 to 0:100.

50. The additive of claim 48 wherein:

the ratio of combustible fuel: additive is between about 99:1 to 50:50.

51. The additive of claim 48 wherein:

in subpart (a)(i) the alcohol is ethanol with 5% by volume or less of methanol,
in subpart (a)(ii) the alcohol is iso-propanol,
in subpart (b)(i) the alcohol is 2-ethyl-hexanol-1 or C8-10 alcohols,
in subpart (b)(ii) the alcohol is branched-chain C13-18 alcohols,
in subpart (b)(iii) the alcohol is C12-18 with 3 ethylene oxide add-ons,
in subpart (c) the fatty acid is linoleic acid, oleic acid or combinations thereof, and
in subpart (c) is aqueous ammonia or urea or combinations thereof.

52. The additive of claim 48 wherein:

in subpart (a)(i) the alcohol is ethanol with 5% by volume or less of methanol,
in subpart (a)(ii) the alcohol is iso-propanol or iso-butanol,
in subpart (b)(i) the alcohol is 2-ethyl-hexanol-1 or C8-10 alcohols,

subpart (b)(ii) and,

subpart (b)(iii) are excluded,

in subpart (c) the fatty acid is linoleic acid, oleic acid or combinations thereof, and

in subpart (c) the source of nitrogen is aqueous ammonia, urea or combinations thereof.

53. The additive of claim 48 wherein:

in subpart (a)(i) the alcohol is ethanol with 5% by volume or less of methanol,

in subpart (a)(ii) the alcohol is iso-propanol,

in subpart (b)(i) the alcohol is 2-ethyl-hexanol-1 or C8-10 alcohols,

in subpart (b)(ii) is excluded,

in subpart (b)(iii) the alcohol is C12-18 with 3 ethylene oxide add-ons,

in subpart (c) the fatty acid is linoleic acid, oleic acid or combinations thereof, and

in subpart (c) the nitrogen source is aqueous ammonia, urea or combinations thereof.

54. The additive of claim 1 wherein the additive is used as a fuel extender or as the total fuel wherein:

in subpart (a) the ratio of (a)(i):(a)(ii) is between about 100:0 to 50:50 where (a)(i) is anhydrous or 0.50 to 36% aqueous,

in subpart (b) the ratio of (b)(i):(b)(ii):(b)(iii) is between about 100:0 to 50:50,

in subpart (b) the ratio of (b)(ii):(b)(iii) is between about 100:0 to 0:100, and

in subpart (c) nitrogen is present to neutralize between about 40-85% of the fatty acid.

55. The additive of claim 54 wherein the additive is used as a fuel extender or as the total fuel wherein:

the ratio of subparts (a):(b) + (c) is between about 40:60 to 10:90, and

the ratio of subparts (b):(c) is between about 80:20 to 20:80,

57. The additive of claim 54 wherein the additive is used as a fuel extender or as the total fuel wherein:

the ratio of combustible fuel:additive is between about 50:50 to 0:100.

58. The additive of claim 54 wherein the combustible fuel is diesel fuel, kerosene, heating oil, or other distillates wherein:

in subpart (a)(i) the alcohol is ethanol with 5% by volume or less of methanol,

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in subpart (a)(ii) the alcohol is iso-propanol or iso-butanol,
in subpart (b)(i) the alcohol is 2-ethyl-hexanol-1 or C8-10 alcohols,
in subpart (b)(ii) the alcohol is branched-chain C12-18 alcohols,
in subpart (b)(iii) the alcohol is C13-15 with 3 ethylene oxide add-ons,
in subpart (c) the fatty acid is linoleic acid or oleic acid or combinations thereof, and
in subpart (c) the nitrogen source is aqueous ammonia or urea or combinations thereof.--

There is no amendment to Claim 29.

REMARKS

Applicant has amended the claims extensively. They reflect the claims now pending in the equivalent PCT application, PCT/US99/00598 as examined by Ellen McAvoy in the USPTO at (1-703-308-0661).

Applicant responded to the Written Opinion in the PCT by Express Mail on March 7, 2000. No new matter has been added to the application.

REJECTION OF CLAIMS 1-29 UNDER 35 U.S.C. 112

Claims 1-29 are rejected under 35 U.S.C. 12, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 1-29 are rejected.

The Examiner states that:

"Claims 1-29 are replete with indefinite and/or incorrect terms. Additionally, numerous claims fail to positively recite the components of the claimed composition. Accordingly, it is impossible to determine just what is being claimed. Specific examples are:

In claim 1, Markush groups are required to use the terminology "selected from the group consisting of". Markush groups are also to use the term "and" as opposed to "or". In a(ii), the term "by volume" is not understood. Claim 1, line 28 recites "alkyl, alkenyl or alkynyl having between about 10 to 24 carbon atoms, with". It is unclear if the composition may contain component "d" without component "e" or if a composition containing component "d" must also contain component "e". In component "e" the recitation "wherein trialkylamines are excluded" is not understood. It is unclear how the recitation "having a viscosity similar to that of the